Feb. 11, 1969 L. MIZELL 3,426,719

MARINE TRANSFER DEVICE

Filed May 3, 1966

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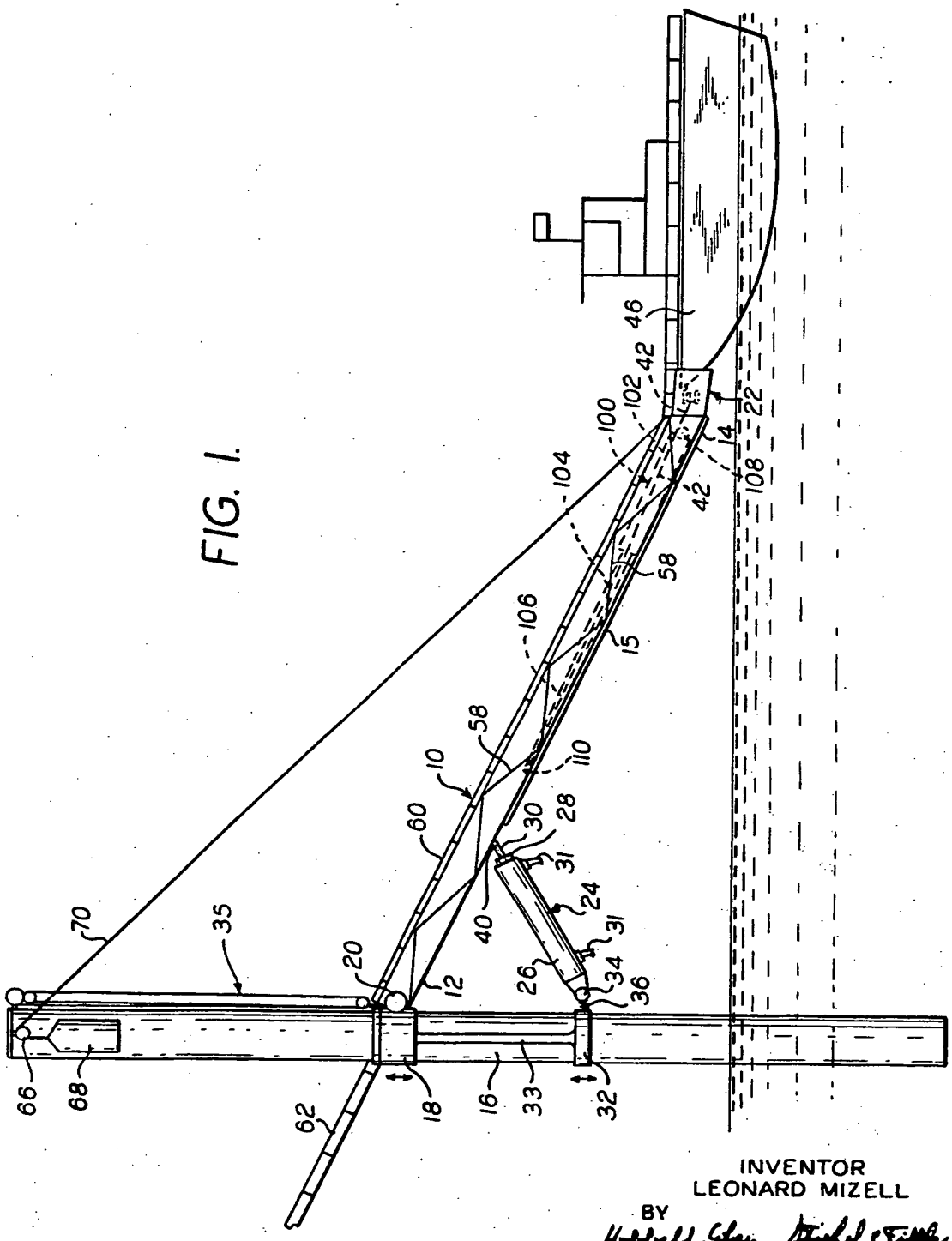
FIG. 1.



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MARINE TRANSFER DEVICE

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FIG. 2.

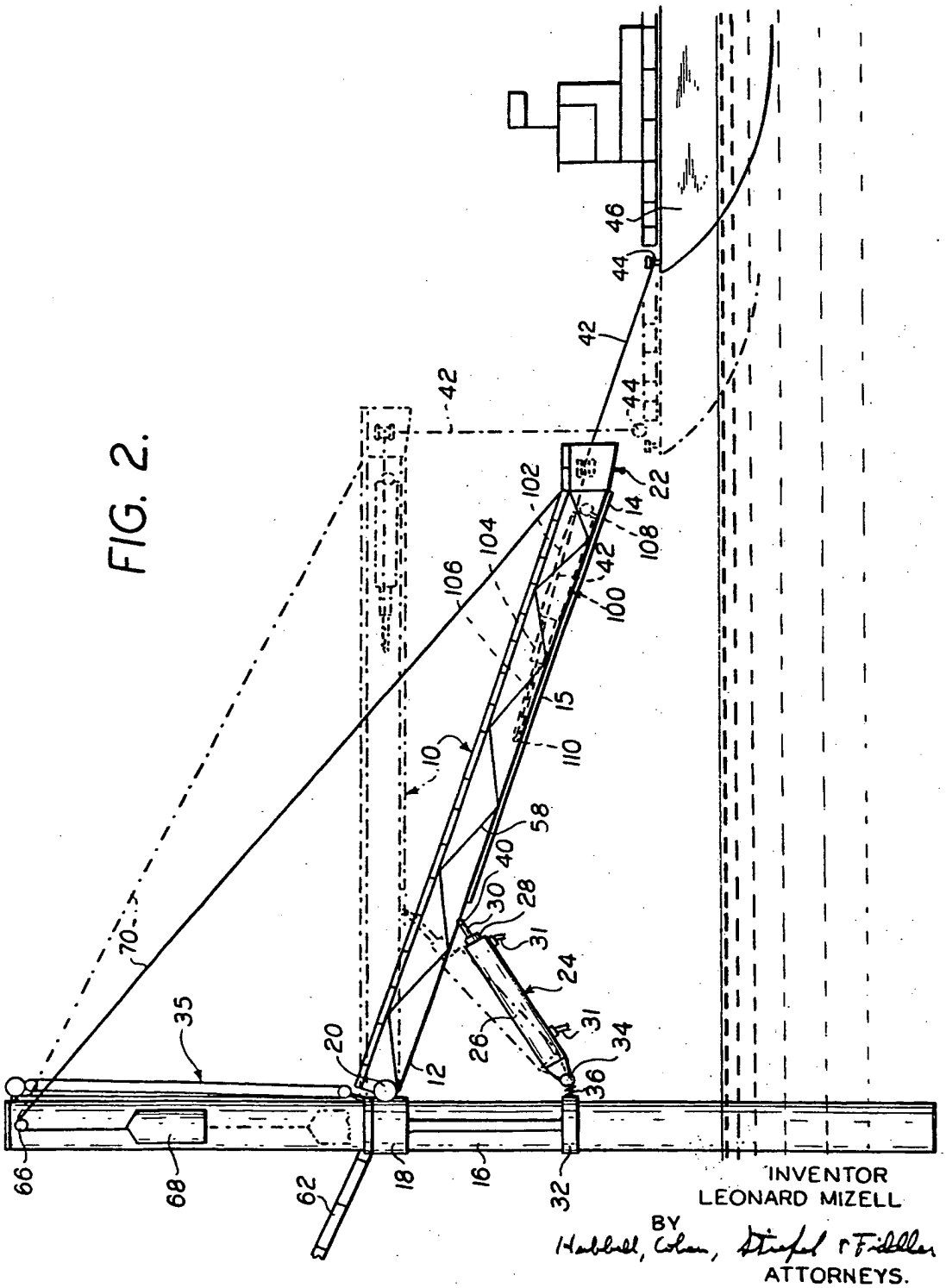

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FIG. 3.

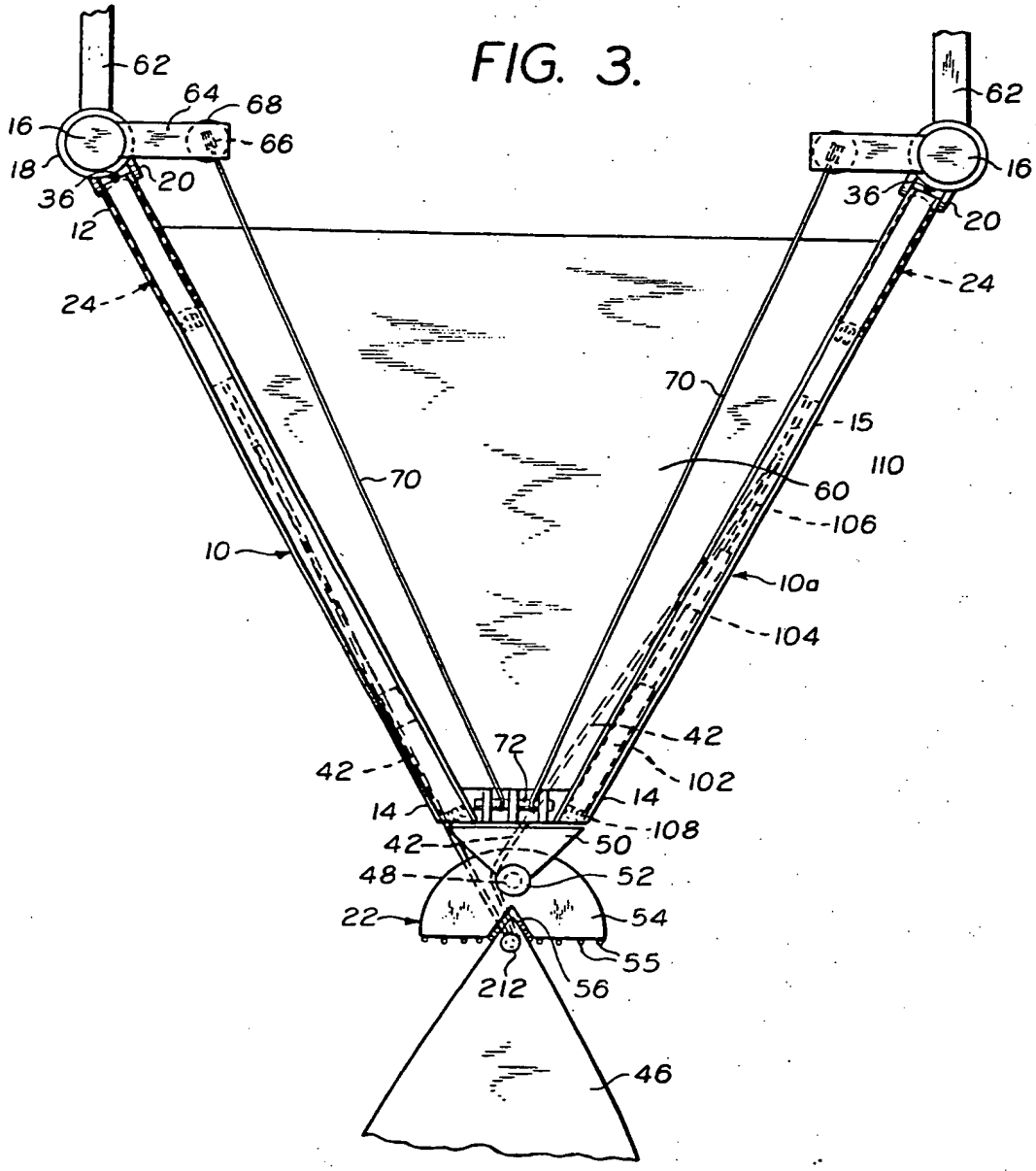

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FIG. 4.

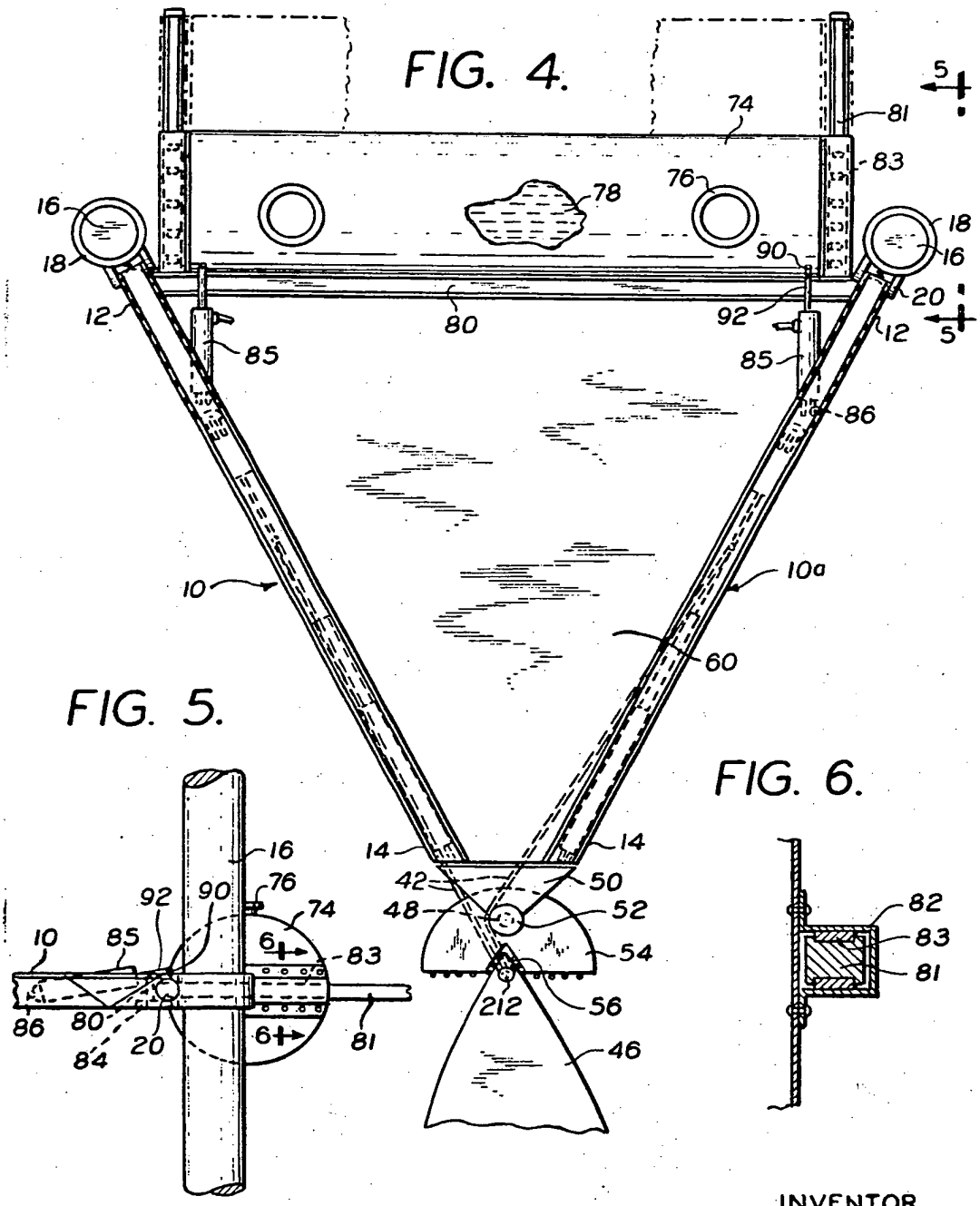

FIG. 5.

FIG. 6.

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MARINE TRANSFER DEVICE

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Filed May 3, 1966, Ser. No. 547,334
U.S. Cl. 114—230 6 Claims
Int. Cl. B63b 21/00, 29/02

ABSTRACT OF THE DISCLOSURE

Marine transfer device. Includes ramp with inboard end pivotally mounted to a support and snugging device mounted at outboard end of support. Snugging device includes member rotatably mounted thereon and having a notch for receiving a marine device. Ramp may be raised or lowered by hydraulic ram, one end of which is secured to a support, the other end being secured to the ramp. Ramp also carries a hydraulic ram therewithin, one end being secured to the ramp. Ramp also carries a hydraulic ram therewithin, one end being secured to ramp and the other being slideable along ramp. Cable is secured to slideable end of ram, disposed about snugging device, and has free end for securement to marine vessel.

This invention relates to a marine transfer device. More particularly, this invention relates to an improved transfer ramp which is adapted for connection between marine structures subject to relative movement therebetween, such as, e.g., between a stationary platform or dock and a moving vessel or between two moving vessels.

My invention finds particular application in the unloading of ships, off shore drilling rigs, and other vessels in rough waters. Thus, even when the waters impart a pitching, rolling, or yawing action to the vessel, my invention provides a stable connection between the vessel and another structure on which the vessel is to be off loaded, e.g., a larger vessel, a dock, etc.

SUMMARY OF THE INVENTION

In accordance with one aspect of my invention, there is provided a marine transfer device for connection between marine structures subject to relative movement therebetween. This device comprises, in combination, a substantially rigid ramp having an inboard end and an outboard end and having a longitudinally extending track thereon, a support for the inboard end, means for pivotally mounting the inboard end to the support, snugging means mounted at the outboard end of the support, the snugging means comprising (1) a pin mounted at the outboard end, (2) a first member rotatably mounted on the pin, and (3) a second member mounted for rotation about the pin and having a V-shaped notch therein for receiving a marine device, an extendable and retractable hydraulic ram having a first and second end, the first end being pivotally mounted to the support, the second end being pivotally mounted to the ramp, a second extendable and retractable hydraulic ram carried by the ramp, one end of this ram being pivotally secured to the ramp and the other end being disposed in the track for slidable and pivotal movement with respect to the track, and a cable secured to the other end of the ram and extending around the first rotatable member, the cable having a free end for securement to a marine device. The device desirably also includes means for counterweighting the ramp.

Additional objects, characteristics, features, and advantages of my invention will become apparent from the following detailed description taken in conjunction with the accompanying drawings wherein:

FIG. 1 is a schematic elevational view of one embodiment of the marine transfer device of my invention,

and shows a landing ramp connected to a ship for unloading;

FIG. 2 is a schematic elevational view of the marine transfer device shown in FIG. 1, with the broken lines showing the landing ramp and ship in initial positions and the solid lines showing the landing ramp lowered and the ship being hauled toward the ramp;

FIG. 3 is a plan view looking down on the marine transfer device shown in FIG. 1;

FIG. 4 is a plan view showing an alternative embodiment of my marine transfer device wherein a water tank counterweights the landing ramp;

FIG. 5 is a detail view taken along line 5—5 of FIG. 4 and shows the mode of connection between the water tank and landing ramp; and

FIG. 6 is a detail view taken along the line 6—6 of FIG. 5.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring now to the drawings, and particularly to FIGS. 1–3, there is shown one embodiment of the marine transfer device of my invention. This device includes a ramp, generally designated by the reference character **10**, and having an inboard end **12** and an outboard end **14**. The ramp is provided with a longitudinally extending track **15** which serves as a guide for a hydraulic ram to be described hereinafter.

A fixed post **16**, e.g., a piling or the like, serves as a support for the inboard end **12** of the ramp **10**. A collar or sleeve **18** encircles the post **16** and is positioned to the desired height and then secured to the post **16** by any suitable means (not shown), e.g., set screws, clamps, etc. The collar **18** is socketed to accommodate a ball **20** and the inboard end **12** of the ramp is pivotally connected thereto.

The outboard end **14** of the ramp **10** carries a snugging device generally identified by the reference numeral **22**, which device will be more particularly described hereinafter.

A hydraulic ram **24** is disposed beneath the ramp **10**. As shown in FIG. 2, the ram **24** is made up of a plurality of telescoping sections **26**, **28**, and **30**. Ports **31** are provided for the introduction and removal of hydraulic fluid to and from the ram **24**. The post **16** serves to support the hydraulic ram **24** as well as the ramp **10**. Thus, a collar **32** encircles the post and is adjusted to the desired height and then secured to the post. One end **26** of the ram **24** is pivotally mounted on ball **34** (FIG. 2). The ball **34** is either disposed in a socket in collar **32**, or, as shown in FIGS. 1 and 2, shock absorber means **36**, e.g., a spring, may be disposed between the ball **34**, and the collar **32**. The end **40** of the last telescoping section **30** of the hydraulic ram **24** is pivotally connected to the underside of the ramp **10**. Thus, as the hydraulic ram **24** is extended or retracted the ramp **10** swings either upwardly or downwardly about the pivot point **20**, thereby raising or lowering outboard end **14**.

A second hydraulic ram, generally designated by the reference character **100**, is disposed within the ramp **10** near the outboard end **14**. The ram **100** contains a plurality of telescoping sections **102**, **104** and **106**. One end **108** of the ram **100** is pivotally secured to the ramp. The end **110** of section **106** rides in track **15** of the ramp **10**. Thus, as the hydraulic ram is extended or retracted the end **110** rides in track **15**, the movement of ram end **110** being both slidable and pivotal with respect to track **15**.

Secured to the end **110** of the hydraulic ram **100** is a cable **42**. This cable extends around the rotatable member **52** and its free end **44** (FIG. 2) is available for securement to a ship **46** or other marine vessel.

As shown in FIG. 3, the snugging device 22 includes a pin 48 which is mounted on base 50. The base is connected to the outboard end 14 of the ramp 10. A collar 52 is rotatably mounted on the pin 48. Segment 54 is also, rotatably mounted about pin 48. The segment 54 is provided with a V-shaped notch 56 which serves to accommodate the prow of a vessel 46 which is to be unloaded.

It will be noted that cable 42 is wrapped around collar 52. If a pair of ramp-ram assemblies are employed (FIG. 3), then each cable 42 is wrapped around collar 52. Of course, in such instance the cables 42 are so wrapped about the collar 52 that when the cables are pulled in one direction, e.g., toward the posts 16, they each will rotate the collar in the same direction (which would be clockwise in FIG. 3).

It is desirable to provide boat fenders 55 along that side of segment 54 accommodating V-notch 56, as shown in FIG. 3.

The ramp 10 is provided with bracing members 58 which serve to both impart rigidity thereto and to support a platform 60 which may be used for loading or unloading.

As shown in FIG. 3, rather than using a single ramp-hydraulic ram assembly, a pair of ramps 10, 10*a*, rams 24, and rams 100 are provided. The outboard end 14 of each ramp is connected to base 50 to thereby provide a stable triangular support for the platform 60. Thus, each ramp may comprise a pair of angularly disposed frame members 10, 10*a* joined at their apex and supporting a platform 60 as shown in FIGS. 3 and 4. Each such frame member is provided with a track 15. Extending behind and connected to each post 16 is a walkway 62.

It is particularly advantageous to counterweight the ramp 10. As shown in FIGS. 1–3, this is conveniently achieved by utilizing a support 64 (FIG. 3) which is connected to (or integral with) and extends from collar 18. A pulley 66 is mounted beneath support 64. A counterweight 68 is suspended by a cable 70 which runs from the counterweight 68 about pulley 66 and is secured to the outboard end 14 of the ramp, as by connection to a winch 72 mounted thereon (FIG. 3).

It will be noted that provision may be made to tie collars 18 and 32 to one another, as by means of link 33. This permits one to raise and lower the entire ramp assembly. Thus, a cable and pulley arrangement, generally designated by the reference character 35, may be provided, with one end of the cable being secured to collar 18. Accordingly, the entire ramp assembly may be raised or lowered as desired by first loosening collars 18 and 32 and then decreasing or increasing the cable length between the pulleys.

FIGS. 4–6 illustrate another embodiment of my invention wherein a different counterweight arrangement is employed. In this embodiment water or other suitable liquid serves as the bulk of the counterweighting mass. Thus, a water tank 74 is provided with openings 76 whereby the desired amount of water 78 may be introduced to the tank 74. The tank is, of course, so disposed that its center of gravity is behind the pivot point 20 of the ramp 10 (FIG. 5). A beam 80 is secured to the inboard end 21 of each ramp 10.

Extending rearwardly from the beam 80 are a pair of arms 81. While these arms are shown cantilevered from the beam, additional support for the arms (not shown) may of course be provided.

The tank 74 is provided at both sides thereof with channels 82 (FIG. 6), which may be secured to the tank by any suitable means, e.g., as by bolting. Arms 81 extend through channels 82 to thereby support the tank. In order that the tank may be easily moved along the arms, roller bearings 83 are provided between the arm surfaces and the interior surfaces of the channel.

To provide means for moving the tank 74 along the arms 81 and thereby varying the length of the moment arm of the counterweight, a pair of hydraulic jacks are provided. One end 86 of each jack is pivotally connected to the ramp 10. The other end 90 of the telescoping section 92 of the jack 85 is pivotally connected to the tank 74. This construction permits one to readily vary the moment arm of the counterweight by either retracting or extending the jack 85. That is, by extending the jack, the tank 74 will slide along arms 81 in a direction away from the ramps 10, thereby increasing the moment arm; conversely, retraction of jack 85 moves the tank 74 toward the ramps 10 and decreases the moment arm.

The operation of my marine transfer device is best understood by a consideration of FIGS. 1–3. Referring to FIG. 2, the dotted lines show the ramp assembly in an initial position with the vessel 46 in position to receive the free end 44 of the cable 42. The free end 44 of the cable is secured to the prow of the vessel 46, as by tying it to a cleat 212. The engines of vessel 46 are then put in reverse, so that it moves rearward (to the right in FIG. 2), while at the same time the ram 24 is gradually retracted so that the ramp 10 swings downwardly about pivot 20. The hydraulic ram 100, which is in a relatively retracted position, is then extended, to thereby pull the ship 46 into the snugging device 22 (FIG. 1). Thus, the prow of the ship enters the V-notch 56 of segment 54 and the ship is held firmly in position (FIGS. 1 and 3). The ship may now be readily unloaded.

It will be seen that the present invention provides a marine transfer device for connection between marine structures subject to relative movement therebetween. This device affords a means for effecting a stable connection between such marine structures, even in rough and heavy seas. One particularly advantageous use for the marine transfer device of this invention is in the offloading of offshore drilling rigs.

The provision of an extendable-retractable hydraulic ram 100 for hauling a vessel 46 into engagement with the snugging device 22 and holding it in the snugged position is of significant advantage due to the great power such rams can deliver. Moreover, the provision of a V-notch 56 in the segment 54 ensures a firm engagement of the vessel 46 with the snugging device 22.

This invention is not limited to the structures and modifications disclosed in the embodiments of the drawings, but also includes other structures to the extent that such may be included as part of the invention as encompassed by the broad spirit thereof.

Having thus described my invention, what I desire to secure and claim by Letters Patent is:

1. A marine transfer device for connection between marine structures subject to relative movement therebetween comprising, in combination:

(a) a substantially rigid ramp having an inboard end and an outboard end and having a longitudinally extending track thereon,

(b) a support for the inboard end,

(c) means for pivotally mounting the inboard end to the support,

(d) snugging means comprising

(1) a pin mounted at the outboard end,

(2) a first member rotatably mounted on said pin, and

(3) a second member mounted for rotation about said pin, said second member having a V-shaped notch therein for receiving a marine device,

(e) an extendable and retractable hydraulic ram having a first and second end, said first end being pivotally mounted to said support, said second end being pivotally mounted to said ramp,

(f) a second extendable and retractable hydraulic ram carried by said ramp, one end of said ram being pivotally fixed to said ramp and the other end being disposed in said track for slidable and pivotal movement with respect thereto, and

(g) a cable secured to said other end of said ram and extending around said first rotatable member, said cable having a free end for securement to a marine device.

2. The marine transfer device of claim 1, said device additionally comprising

(h) means for counterweighting said ramp.

3. The marine transfer device of claim 2, said means for counterweighting said ramp comprising

(1) a weight and

(2) means for operatively connecting said weight to said ramp such that the center of gravity of said weight is disposed behind the point about which said ramp pivots.

4. The marine transfer device of claim 3, said means for counterweighting said ramp additionally comprising

(3) means for varying the moment arm about which said weight acts.

5. The marine transfer device of claim 3 wherein said weight comprises a tank containing liquid therein.

6. A marine transfer device for connection between marine structures subject to relative movement therebetween comprising, in combination:

(a) a pair of substantially rigid angularly disposed frame members, each frame member having an inboard end, an outboard end, and a longitudinally extending track, said frame members converging at their outboard ends and supporting a pin;

(b) a platform mounted on said frame members;

(c) a support for each of said inboard ends, said inboard ends being pivotally mounted to said support in spaced relationship to one another;

(d) snugging means including (1) a member rotatably mounted on said pin and having a notch therein for receiving a marine transfer device and (2) a collar rotatably mounted on said pin;

(e) an extendable and retractable hydraulic ram for each of said frame members and disposed therebeneath, said rams each having a first and second end, said first ends each being pivotally mounted to said support in spaced relation from one another, said second ends each being pivotally mounted to said frames;

(f) a second extendable and retractable hydraulic ram carried by each frame, one end of each of said rams being pivotally fixed to its respective frame and the other end being disposed in said track for slideable and pivotal movement with respect thereto; and

(g) a cable for each of said second rams, each cable being secured to said other end of its respective second ram, extending about said collar, and having a free end for securement to a marine device.

References Cited

UNITED STATES PATENTS

2,963,179	12/1960	Kanady et al.	61—48 XR
3,008,158	11/1961	Stinson	14—71
3,155,069	11/1964	Ross et al.	114—230
3,336,896	8/1967	Burnett	115—7

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U.S. Cl. X.R.

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